



oniroProject

A yocto-based
PROJECT

product-ready distribution

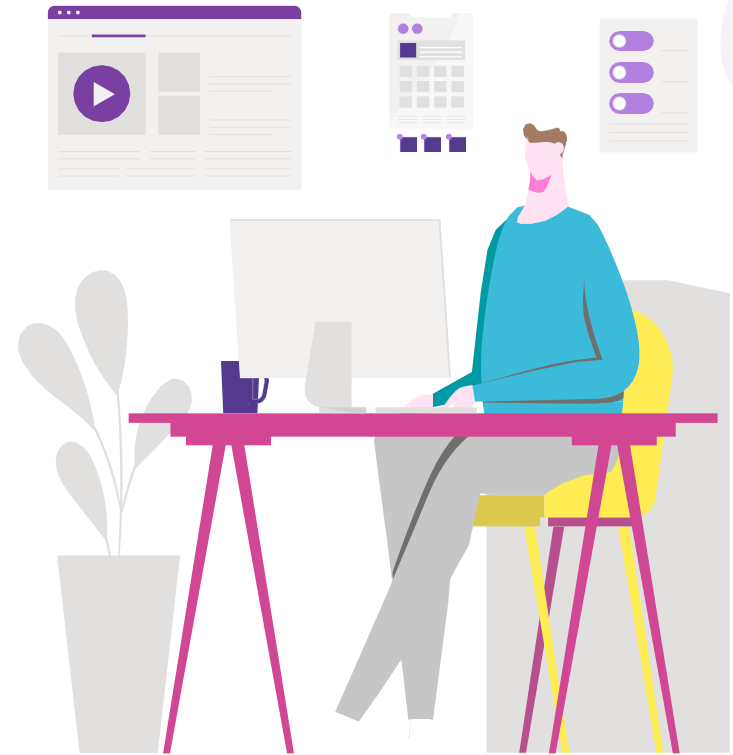
The **distributed** **operating** **system**
targeting IoT devices big and small

yocto · THE
PROJECT LINUX
FOUNDATION



Yocto Project Summit, 2022.05

► OK, but who is that fella?

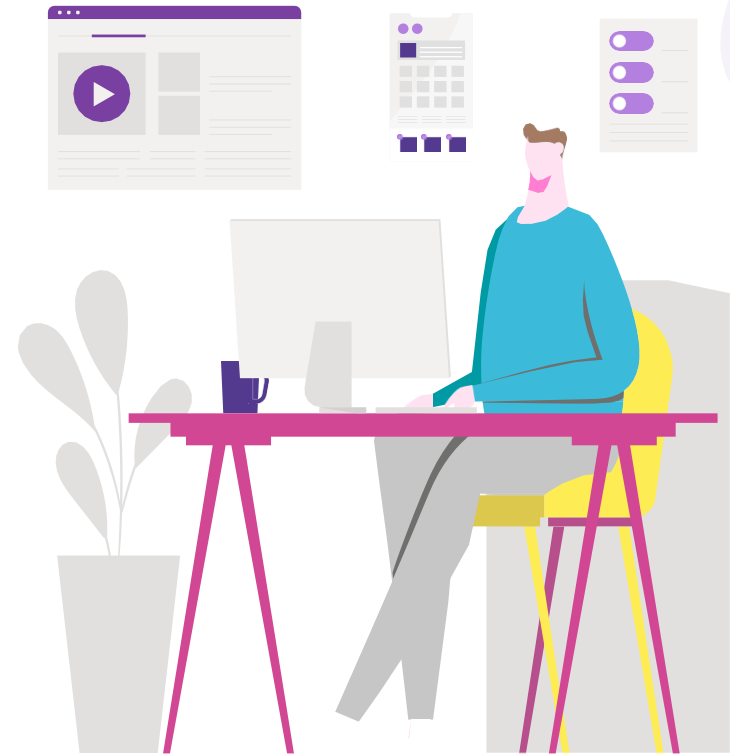


► OK, but who is that fella?

Andrei Gherzan

Huawei Open Source Technology Center

Principal Open Source Architect



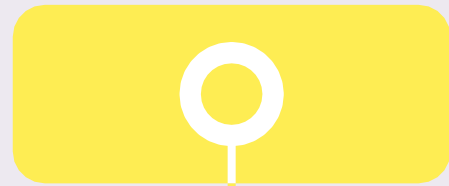
DELIVERING A **UNIQUE USER EXPERIENCE** ACROSS DIFFERENT CONSUMER DEVICES AND SCENARIOS

In a **fully-connected world vision**, consumer device fragmentation is impacting on our daily life...



Think about **how many devices** you use on a regular basis that accompany your day and **how many actions** you have to do to achieve a **good user experience** from each of them.

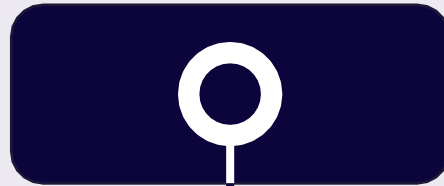
► WHY THIS IS HAPPENING?



Fragmented and isolated consumer devices market



Technology silos



Small developers ecosystem

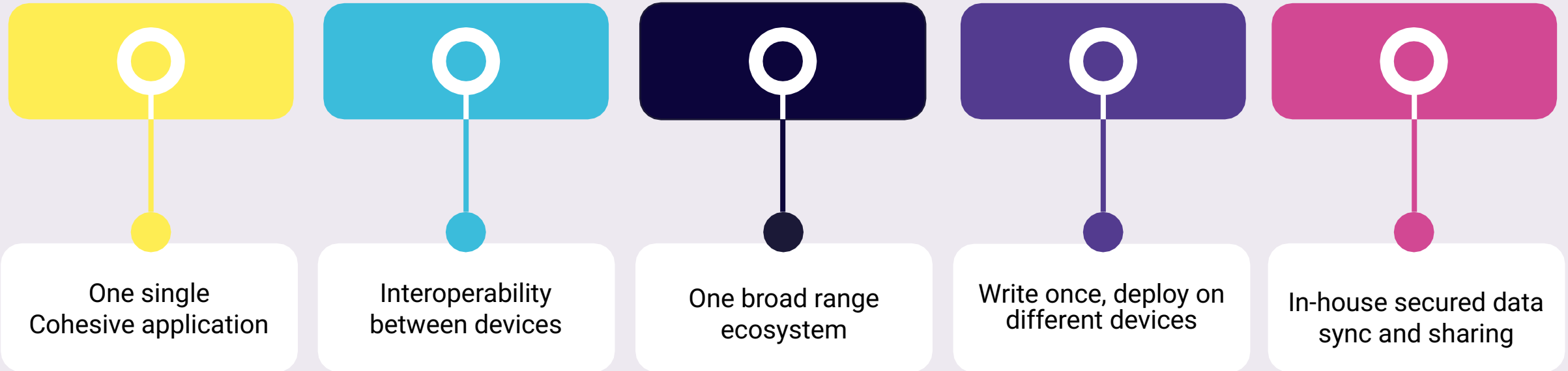


Lack in content creation portability, stability SDK and non unified tools



Communication between devices is enabled by discrete apps that are connected to the Cloud to share and sync data, with lack in performances, speed along with security and privacy issues

▶ IoT NEEDS COMMON STANDARDS TO LIVE UP TO ITS PROMISE OF EMPOWERING CONSUMERS' DAILY LIFE



► WHY OPEN SOURCE

UBIQUITOUS

COLLABORATIVE

OPEN

Open source technology baseline, is the only way to achieve real co-operability, interoperability and communication between different devices because they are natively talking the same language.

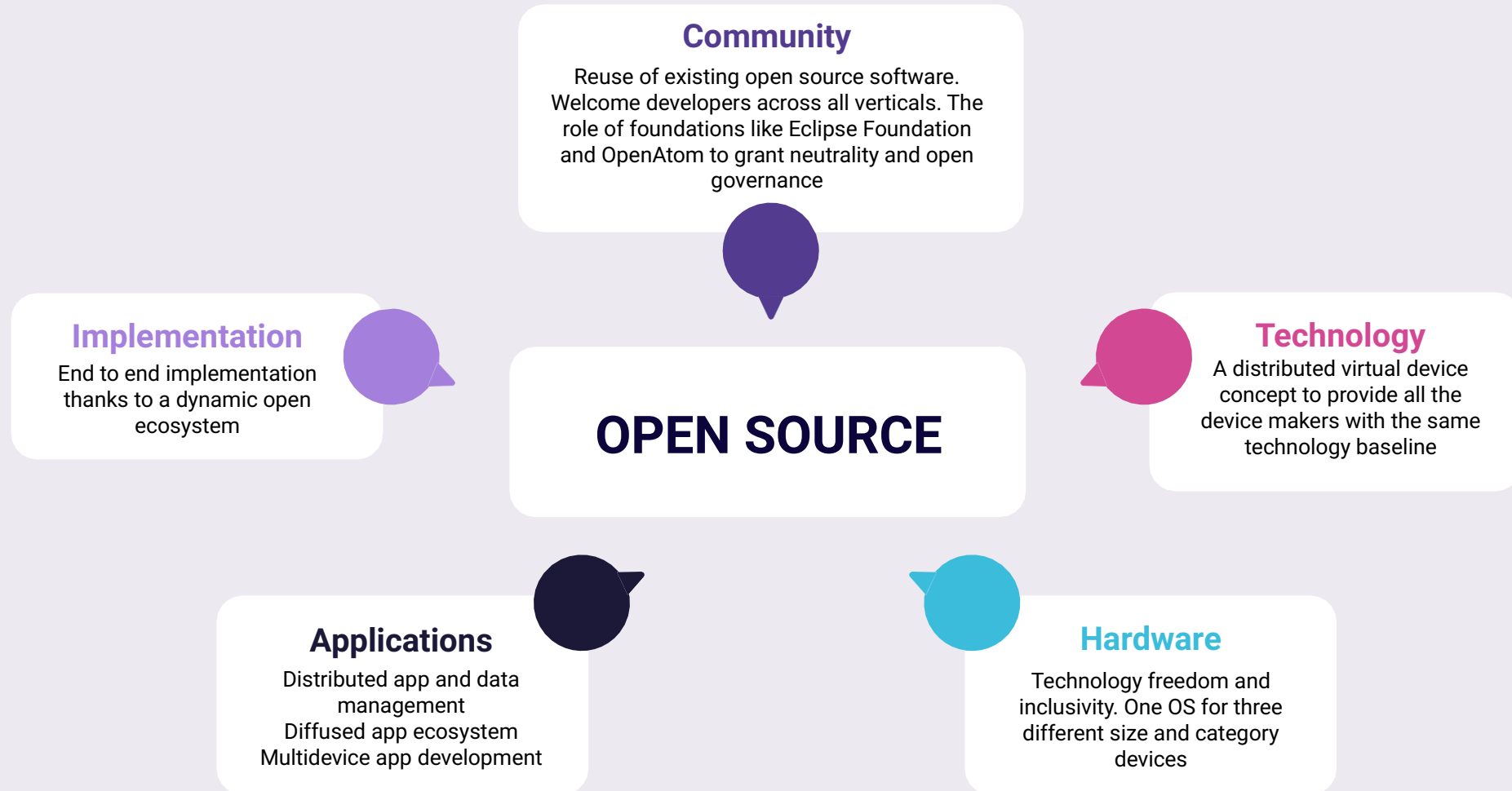


THE INFLUENCE ON REQUIREMENTS, ROADMAP AND FEATURES IS THE KEY!



THE **MISSION** IS TO ACHIEVE THE GOAL OF AVOIDING TECHNOLOGY SILOS THROUGH THE PATH OF **OPEN SOURCE**. THAT MEANS **PROVIDING EVERY DEVICE MAKER WITH THE SAME TECHNOLOGY BASELINE**, IN AN **OPEN, TRUSTED, TRANSPARENT, COLLABORATIVE WAY**.

▶ OPEN SOURCE



ONIRO HAS A LAYERED ARCHITECTURE BUILT AROUND THE
YOCTO PROJECT AND BITBAKE BUILD SYSTEM.

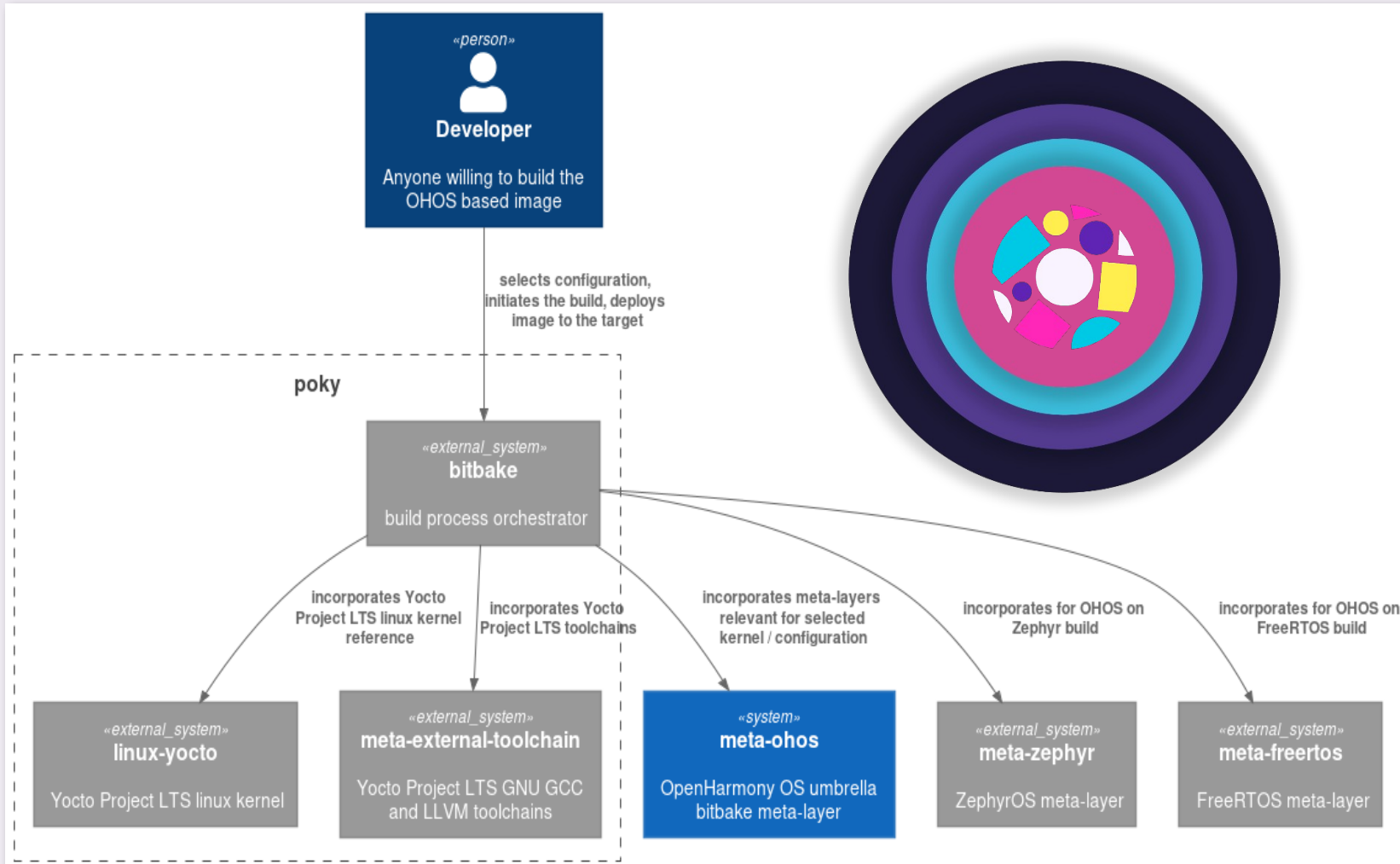
THE YOCTO PROJECT IS **VERY POPULAR** IN THE EMBEDDED LINUX
COMMUNITY AND PROVIDES AN **EXCELLENT PLATFORM FOR DEVELOPING** A
HIGHLY-CUSTOMIZABLE, CROSS-KERNEL OPERATING SYSTEM.

FROM BOTTOM TO TOP, **ONIRO CONSISTS OF THE KERNEL LAYER,
SYSTEM SERVICES LAYER, FRAMEWORK LAYER, AND APPLICATION LAYER.** IN
MULTI-DEVICE DEVELOPMENT, YOCTO PROVIDES THE CAPABILITIES TO TWEAK
LAYERS AND RECIPES TO REMOVE UNNECESSARY SUBSYSTEMS, FUNCTIONS, OR
MODULES AS REQUIRED.

▶ THE ARCHITECTURE LAYERS

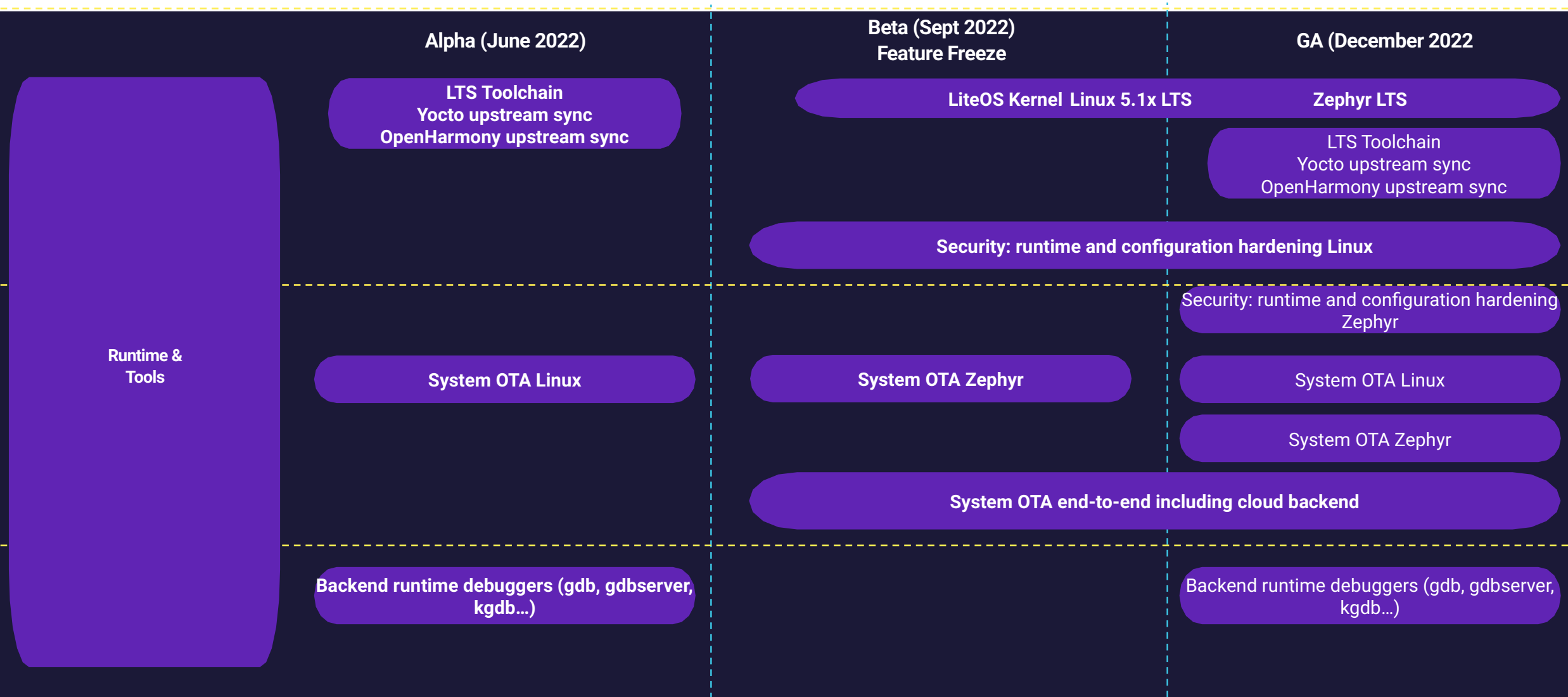


▶ THE ARCHITECTURE LAYERS

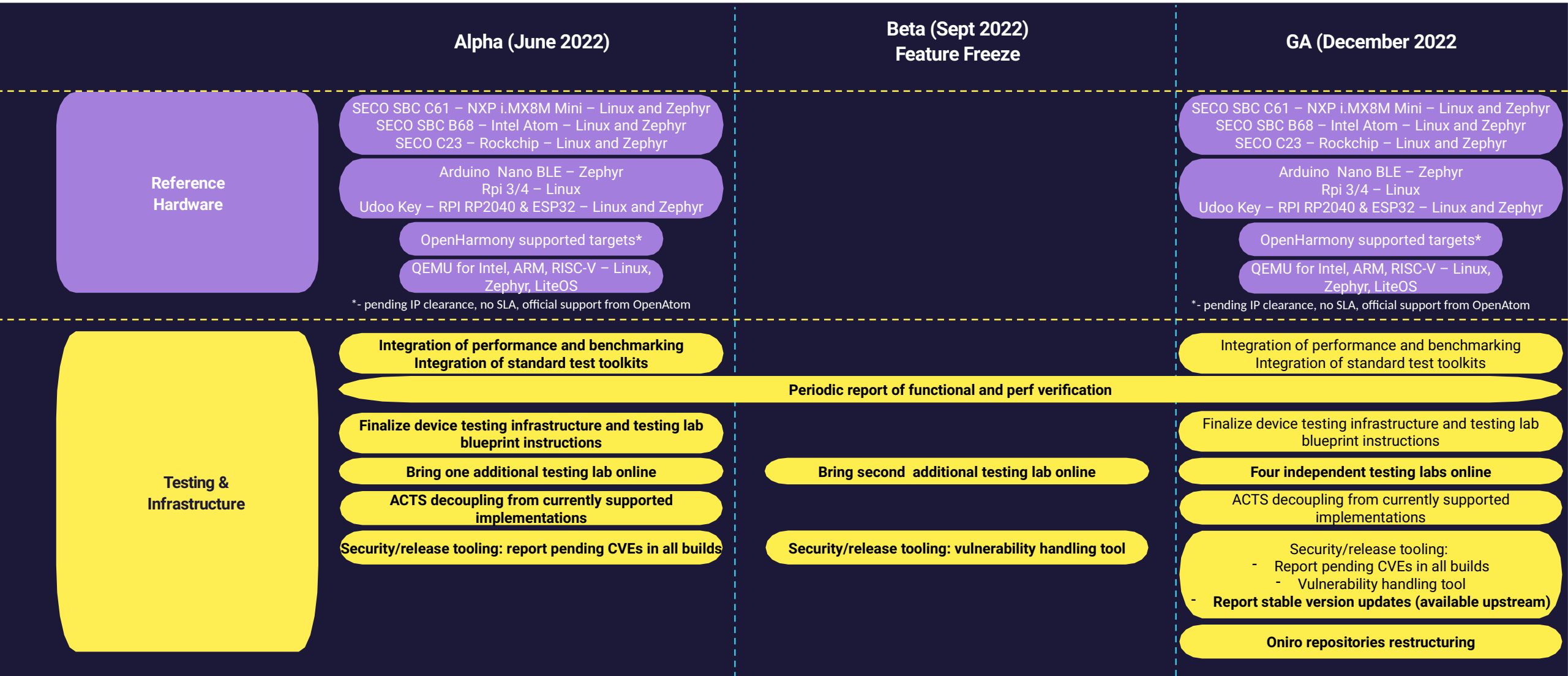


- meta-oniro: root layer
- meta-openembedded
- meta-clang
- meta-zephyr, meta-freertos, meta-liteos
- meta-riscv
- meta-openharmony: openharmony components
- meta-seco, meta-st, meta-av96, meta-intel, ...

▶ ONIRO 22.12 “GOOFY” ROADMAP



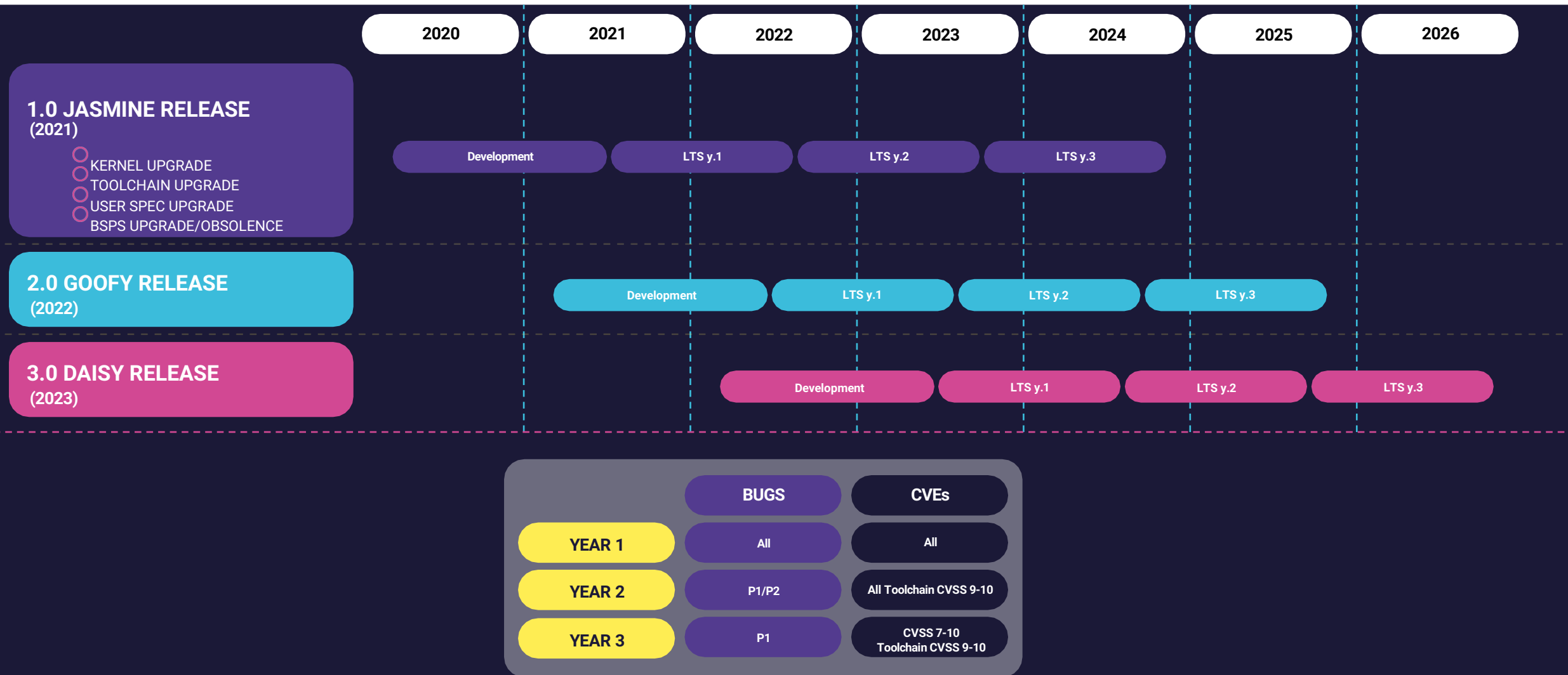
▶ ONIRO 22.12 “GOOFY” ROADMAP



▶ ONIRO 22.12 “GOOFY” ROADMAP



► LIFECYCLE AND RELEASE SCHEDULE



▶ CONTINUOUS INTEGRATION AND DEPLOYMENT

The screenshot shows the OSTC Continuous Integration and Pipelines interface. The top section, titled 'Continuous Integration', explains that All Scenarios OS uses GitLab pipelines for building and testing changes. It lists several repositories: The manifest Repository, The meta-ohos Repository, The xts_acts Repository, The docs Repository, and On-device Testing.

The bottom section, titled 'Pipelines', displays a table of pipeline runs. The table has columns for Status, Pipeline ID, Triggerer, Commit, Stages, and Duration. The first pipeline is currently running, while the others have passed.

Status	Pipeline ID	Triggerer	Commit	Stages	Duration
running	#11845 latest detached	👤	17 258 → ad839f9f weston: wrapper for westo...	🟢🟡🔴🔴	⌛ In progress
passed	#11842 detached	👤	17 258 → 550200be weston: wrapper for westo...	🟢🟢🟢🟢	⌚ 01:07:30 🕒 1 hour ago
passed	#11835 detached	👤	17 258 → bf7633fb weston: wrapper for westo...	🟢🟢🟢🟢	⌚ 01:23:43 🕒 10 hours ago
passed	#11829 latest detached	👤	17 257 → 2f83a50d openjdk-7: Fix recipe pars...	🟢🟢🟢🟢	⌚ 01:05:10 🕒 11 hours ago
passed	#11827 latest detached	🌐	17 235 → 3b30ff10 docs: Add helper makefile	🟢🟢	⌚ 00:00:12 🕒 15 hours ago
passed	#11824 detached	🌐	17 235 → 2d98d0ea docs: Add helper makefile	🟢🟢	⌚ 00:00:11 🕒 15 hours ago
passed	#11822 latest detached	🌐	17 256 → 8c808173 touchpanel: Add Disclaim...	🟢🟢	⌚ 00:00:16 🕒 15 hours ago

- gitlab runners for builds, with git-repo cache, bitbake sstate and download cache
- strategic placement of jobs across repositories to ease maintenance
- lava for smoke testing on hardware and in virtual environments
- Scancode, Fossology, REUSE, Debian matcher for license compliance and SPDX SBOM

- 14 shared jobs for images officially supported
- workspace --> assembles all repos via git repo
- bitbake-workspace --> initialized bitbake build
- build-linux, build-zephyr, build-freertos, build-liteos
- build-docs
- lava-test, lava-report
- ip-scan

TESTING

Results for test suite lava - Test Job 1857

Exports

Test suite export: CSV or YAML

Show 25 entries

Name	Test Set	Result	Measurement	Units	Logged
validate	—	✓ pass	—	—	09/06/2021 8:52 a.m.
http-download	—	✓ pass	35.1700000000	seconds	09/06/2021 8:52 a.m.
git-repo-action	—	✓ pass	2.3500000000	seconds	09/06/2021 8:52 a.m.
test-overlay	—	✓ pass	0.0000000000	seconds	09/06/2021 8:52 a.m.
test-install-overlay	—	—	—	—	—
test-runscript-overlay	—	—	—	—	—
git-repo-action	—	—	—	—	—
test-overlay	—	—	—	—	—
test-install-overlay	—	—	—	—	—
test-runscript-overlay	—	—	—	—	—
git-repo-action	—	—	—	—	—
test-overlay	—	—	—	—	—
test-install-overlay	—	—	—	—	—
test-runscript-overlay	—	—	—	—	—
git-repo-action	—	—	—	—	—
test-overlay	—	—	—	—	—

Summary Details Timing

debug info warning error input output feedback results

lava-dispatcher, installed at version: 2021.03

start: 0 validate

Start time: 2021-09-06 08:52:04.064952+00:00 (UTC)

Validating that https://git.ostc-eu.org/api/v4/projects/92/jobs/58323/artifacts/artifacts/images/qemu86/allscenarios-image-base-tests-qemu86.rootfs.wic.b2 exists

validate duration: 5.41

case: validate

case id: 217916

definition: lava

result: pass

start: 1.1 deployimages (timeout 00:10:00) [common]

start: 1.1.1 http-download (timeout 00:10:00) [common]

start: 1.1.1.1 http-download (timeout 00:10:00) [common]

downloading https://git.ostc-eu.org/api/v4/projects/92/jobs/58323/artifacts/artifacts/images/qemu86/allscenarios-image-base-tests-qemu86.rootfs.wic.b2

saving as /var/lib/lava/dispatcher/tmp/1857/deployimages-5713u91/rootfs/allscenarios-image-base-tests-qemu86.rootfs.wic

total size: 295182938 (281MB)

Using bunzip2 to decompress b2

progress 0% (0MB)

progress 5% (14MB)

progress 10% (28MB)

progress 15% (42MB)

progress 20% (56MB)

progress 25% (70MB)

progress 30% (84MB)

progress 35% (98MB)

progress 40% (112MB)

progress 45% (126MB)

progress 50% (140MB)

progress 55% (154MB)

progress 60% (168MB)

progress 65% (182MB)

progress 70% (196MB)

progress 75% (210MB)

progress 80% (224MB)

progress 85% (238MB)

progress 90% (252MB)

progress 95% (266MB)

progress 100% (281MB)

281MB downloaded in 35.17s (8.01MB/s)

end: 1.1.1.1 http-download (duration 00:00:35) [common]

case: http-download

case id: 217917

definition: lava

duration: 35.17

extra: ...

- LAVA based, decentralized, distributed device testing
- Each member, contributor,... can add physical devices at different locations
- Device added under testing can be shared via public cloud infrastructure
- Each site can add one to hundreds of devices
- Sites broadcast their availability to a central repository / directory

IP AND FOSS

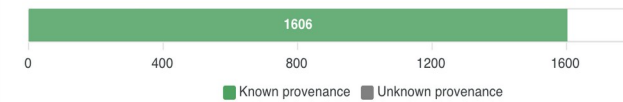
FOSSology audit progress

Total audit files



Provenance

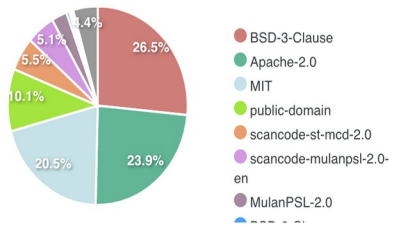
Upstream source total: 1606



License types scanned

27

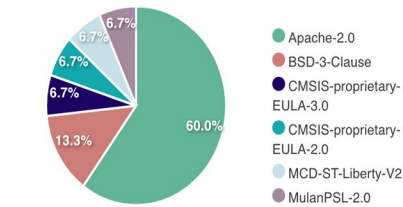
Results from automated scanners such as scancode, monk, nomos, ojo



Main license types

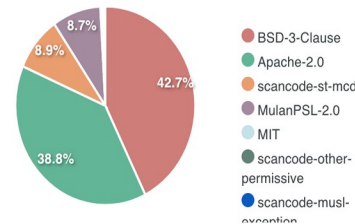
6

Accumulated main licenses



License types audited

Results by human auditor analysis



Main Licenses

accumulated

6

Files

total

1606

Distros

accumulated

0

Images

accumulated

0

Machines

accumulated

0

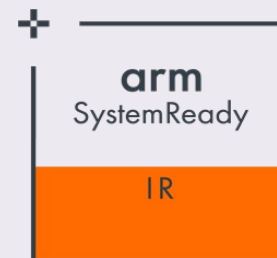
Releases

accumulated

1

- Openchain Specification 2.0
- Training, R&R, fundings, activity, IP auditing embedded into R&D
- IP compliance integrated in CI / CD
- Low Resolution SBOM
 - Merge --> Scan --> Fossology Dashboard
- High Resolution
 - Fossology --> IP Auditors --> SPDX
- Releases SBOMs for alpha, beta and official yearly release

▶ STANDARDS AND COMPLIANCE



Oniro Project integrates its various components into a representative use-case called a *Blueprint*.

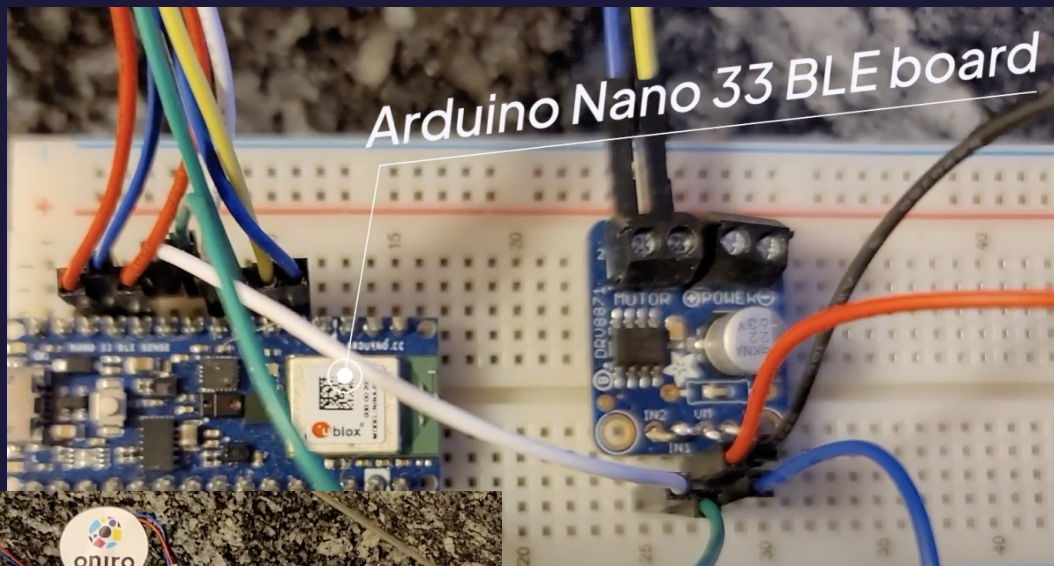
A blueprint shows off the OS capabilities and best practices in building software-based products.

To this end, **blueprints** are a way to distill real-world products into a **minimum viable product** to demonstrate how partners and users may adopt Oniro Project securely in their own products.

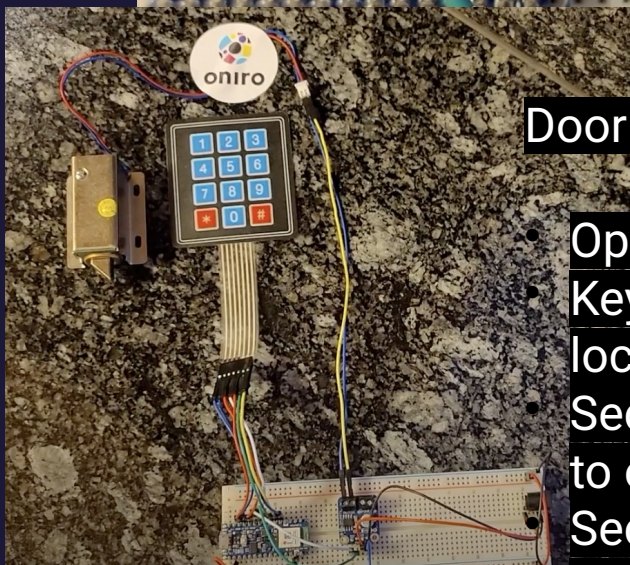
What is a Blueprint?

1. It shows off a key feature or two of the product it is trying to emulate
2. It focuses on reproducing a representative user interaction for a use case
3. It is implemented on the closest appropriate reference HW platform from Oniro Project

▶ BLUEPRINTS



Arduino Nano 33 BLE board



Doorlock Blueprint:

- Operating several types of locks
- Keypad input to operate the lock locally
- Secure wireless communication to operate the lock locally
- Secure communication with the lock remotely
- Secure OTA



Gateway Blueprint:

- WiFi AP functionality
- OpenThread Border Router functionality
- Onboarding of a mesh node in an OpenThread network
- A mesh node to participate in an OpenThread network

▶ VENDING MACHINE BLUEPRINT

The **Vending Machine** Blueprint provides support for building a PoC smart vending machine with components showing the capabilities of the Oniro Project build infrastructure to easily build an end-to-end solution using multiple operating systems cooperating inside a product.



The **Vending Machine** blueprint provides full support for two complete setups. One based on Raspberry Pi 4B, an ARMv8 target, and one based on SECO B68, an X86 board

[https://
www.youtube.com/watch?v=HQ9hD63ypvI&list=PLy7t4z5
SYNaQBDRzmeHAKnEchYmu0LLa&index=10](https://www.youtube.com/watch?v=HQ9hD63ypvI&list=PLy7t4z5SYNaQBDRzmeHAKnEchYmu0LLa&index=10)

[CHECK THE DOCUMENTATION](#)

<https://docs.oniroproject.org/projects/blueprints/en/latest/vending-machine.html?highlight=vending%20machine>

VENDING MACHINE BLUEPRINT

DEMO TIME

▶ WHAT'S IN IT FOR YOU?



CONSUMERS

If you are an end user, Oniro integrates your various smart devices to implement fast connection, capability collaboration, and resource sharing between them. This way, your services can be seamlessly transferred to a suitable device that delivers smooth all-scenario experience.



DEVICE MAKERS OEMs, SILICON VENDORS, CHIPSET MANUFACTURERS

If you are an application developer, with Oniro, you will have the choice to focus on upper-layer service logic and develop applications in a much easier and more efficient way.



CONTENT CREATORS

If you are a device developer, Oniro uses a component-based software design to tailor itself to your particular device forms based on their respective resource capabilities and service characteristics.

▶ HOW TO GET STARTED



[Download](#)



[Use](#)



[Read the documentation](#)



[Contribute into the community](#)

Join our Mattermost Town Square chat
VISIT OUR WWW.ONIROPROJECT.ORG WEBPORTAL

Thank you!

Communication channels

- Oniro Working Group mailing list: oniro-wg@eclipse.org
- Oniro Projects (technical) mailing list: oniro-dev@eclipse.org
 - Chat channel: [#oniroproject](https://libera.chat) at libera.chat
 - Twitter: [@oniro_project](https://twitter.com/oniro_project) #Oniro